

UNITED STATES PATENT APPLICATION

for

**METHOD AND SYSTEM FOR LISTING ITEMS GLOBALLY AND REGIONALLY,
AND CUSTOMIZED LISTING ACCORDING TO CURRENCY OR SHIPPING
AREA**

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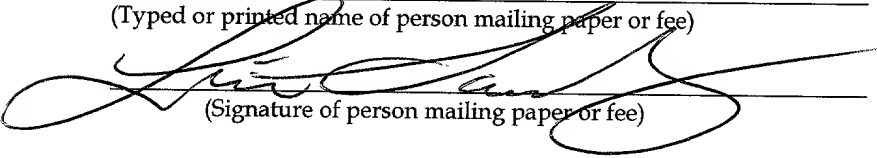
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**METHOD AND SYSTEM FOR LISTING ITEMS GLOBALLY AND REGIONALLY,
AND CUSTOMIZED LISTING ACCORDING TO CURRENCY ON SHIPPING
AREA**

[0001] The present application claims priority from U.S. provisional patent application number 60/241.081 entitled "METHOD AND SYSTEM FOR LISTING ITEMS GLOBALLY AND REGIONALLY, AND CUSTOMIZED LISTING ACCORDING TO CURRENCY ON SHIPPING AREA", filed October 16, 2000.

FIELD OF THE INVENTION

[0002] The present invention relates generally to the field of Internet-based commerce and, more specifically, to a method of facilitating electronic commerce (e.g., the auction of goods and/or services) in a regional manner.

BACKGROUND OF THE INVENTION

[0003] Electronic commerce (a.k.a., e-commerce) technology holds the promise of introducing efficiencies into marketplace and trading activities by automating many trading activities, providing near real-time information to both buyers and sellers and providing convenient channels between buyers and sellers. The ubiquity of the Internet, in particular, has led to the widespread utilization of this technology as a platform for the conducting of electronic commerce and for providing global on-line marketplaces. The increasing globalization of business and trading, no doubt facilitated by the Internet, has exposed a number geographic and regional challenges to electronic commerce. For example, the automated functionality provided by an electronic commerce facility may be unsuitable for global deployment for language, cultural and other reasons.

SUMMARY OF THE INVENTION

[0004] According to the present invention, a method to facilitate network-based commerce includes determining a site that a user accesses, the site being one of multiple sites operated by a network-based commerce facility. A category list available for the site is retrieved, the category list identifying categories of offerings available via the site. The category list is communicated to the user. The site is a regional site, and the category list is a region-specific category list.

BRIEF DESCRIPTION OF THE DRAWINGS

[0005] The present invention is illustrated by way of example and not limitation in the figures of the accompanying drawings, in which like references indicate similar elements and in which:

Figure 1 is a block diagram illustrating an exemplary network-based commerce facility, in the form of an Internet-auction facility.

Figure 2 is a database diagram illustrating an exemplary database maintained and accessed via a database engine server that supports the auction facility.

Figure 3A illustrates an exemplary embodiment of an "items" table within a database maintained by the exemplary auction facility.

Figure 3B illustrates an exemplary embodiment of a "master categories" table maintained by the exemplary auction facility.

Figure 3C illustrates an exemplary embodiment of a "site categories" table maintained by the exemplary auction facility.

Figure 4 illustrates an exemplary embodiment of a code system that includes software modules.

Figure 5 is a diagrammatic representation, according to an exemplary embodiment of the present invention, of the generation of a map file by a listings module utilizing information contained in the items table.

Figure 6 is a diagrammatic representation of case logic implemented by the listings module, according to an exemplary embodiment of the present invention.

Figure 7 is a diagrammatic representation of a map file, according to an exemplary embodiment of the present invention.

Figure 8 is a flow chart illustrating a method, according to an exemplary embodiment of the present invention, of generating a map file.

Figure 9 is a diagrammatic representation illustrating further details of an exemplary implementation of a map file.

Figure 10 is a page diagram illustrating an exemplary page map that constitutes part of a regional or community site supported by a network-based commerce facility.

Figure 11 is a flow chart illustrating a method, according to an exemplary embodiment of the present invention, of generating and communicating information concerning a hierarchical category data structure to a user.

Figures 12A - 12D, 13A - 13D, and 14A - 14E illustrate examples of item list index pages generated by a plurality of different regional sites.

Figures 15A - 15C illustrate a category browse index page, according to an exemplary embodiment of the present invention, for a German site operated by a network-based commerce facility.

Figure 16 is a page map, according to an exemplary embodiment of the present invention, that may be accessible via a search index page.

Figure 17 is a flow chart illustrating a method, according to an exemplary embodiment of the present invention, of facilitating a search of offerings of a network-based commerce facility.

Figures 18A - 18F illustrate exemplary web page interfaces generated by a server and communicated to a client machine, the web pages facilitating the input of search criteria.

Figure 19 is a flow chart illustrating a method, according to an exemplary embodiment of the present invention, of performing a currency conversion for offerings presented via a network-based commerce facility.

Figures 20A - 20B illustrate exemplary item pages for an item originally listed in pounds, but where the item pages are retrieved via U.S. and French sites, respectively.

Figure 21 presents a diagrammatic representation of a machine in the exemplary form of a computer system within which a set of instructions, for causing the machine to perform any one of the methodologies discussed above, may be executed.

DETAILED DESCRIPTION

[0006] In the following description, for purposes of explanation, numerous specific details are set forth in order to provide a through understanding of the present invention. It will be evident, however, to one skilled in the art that the present invention may be practiced without these specific details.

[0007] In general, embodiments described below feature a network-based commerce facility that allows a user of the system to bid on offerings (e.g., products or services) that are for sale by sellers. A preferred embodiment of the present invention features a network-based application for online auctions.

[0008] In one embodiment, the present invention is implemented as a network-based service that may be accessed through, for example, the Internet using a Web browser. According to a first aspect of the present invention, the service provides an interface that allows a user to browse through the offerings that are available in his/her country of location and bid on a particular offering. According to a second aspect of the present invention, the service provides geographically customized information and interfaces to a user of the service.

Internet-related technology

[0009] As indicated above, one embodiment of the present invention provides an Internet-based implementation. Accordingly, some introduction to Internet-related technology is helpful in understanding the present invention. The Internet is a vast and expanding network of computers and other devices linked together by various telecommunications media, enabling the various components to exchange and share data. Sites (so-called Web sites), accessible through Internet, provide information about numerous corporations and products, as well as education, research, entertainment and services.

[0010] A resource that is attached to the Internet is often referred to as a "host." Examples of such resources include conventional computer systems that are made up of one or more processors, associated memory and other storage devices and peripherals, such as modems, networks interfaces and the like that allow for connection to the Internet or other networks. In most cases, the hosting resource may be embodied as hardware and/or software components of a server or other computer system that includes an interface module, which allows for some dialog with users and that may process information through the submission of Web forms completed by the user. Generally, such a server will be accessed through the Internet's graphical user interface, the World Wide Web, (e.g., via Web browsers) in the conventional fashion.

[0011] In order to facilitate communications between hosts, each host has a numerical Internet Protocol (IP) address. The IP address of a hypothetical host computer might be 112.222.64.27. Each host also has a unique "fully qualified domain name." In the case of the hypothetical host 112.222.64.27, the "fully qualified domain name" might be "computer.domain.com", the three elements of which are the hostname ("computer"), a domain name ("domain") and a top-level domain ("com"). A given host looks up the IP address of other hosts on the Internet through a system known as domain name service.

[0012] As previously indicated, in order to access the Internet most users rely on computer programs known as "Web browsers." Commercially available Web browsers include such well-known programs as Netscape's Navigator™ and Communicator™ and Microsoft's Internet Explorer™. If an Internet user desires to establish a connection with a Web page hosted at computer.domain.com, the Internet user might enter into a Web browser program the uniform resource locator (URL) "http://www.domain.com". The first element of the URL is a transfer protocol, most commonly "http" standing for hypertext transfer

protocol, but others include "mailto" for electronic mail, "ftp" for file transfer protocol, and "nntp" for network news transfer protocol. The remaining elements of this URL are an alias for the fully qualified domain name of the host.

[0013] Once a URL is entered into the browser, the corresponding IP address is looked up in a process facilitated by a server computer, called the top-level server. The top-level server matches the domain name to an IP address of a domain name server capable of directing the inquiry to the computer hosting the Web page. Thus, the domain name server ultimately matches an alphanumeric name such as www.domain.com with its numeric IP address 112.222.64.27.

[0014] When a host receives an inquiry from the Internet, it returns the data in the file pointed to by the request to the computer making the inquiry. Such data may make up a Web page, which may include a textual message, sound, picture, or a combination of such elements. A user can move between Web pages through the use of hyperlinks, which are links from one site on the Internet to another.

[0015] A component of one embodiment of the present invention is a computer server. Servers are computer programs that provide some service to other programs, called clients. A client and server communicate by means of message passing often over a network, and use some protocol, a set of formal rules describing how to transmit data, to encode the client's requests and/or responses and the server's responses and/or requests. The server may run continually waiting for client's requests and/or responses to arrive or it may be invoked by some higher-level continually running server, which controls a number of specific servers. Client-server communication is analogous to a customer (client) sending an order (request) on an order form to a supplier (server) dispatching the goods and an invoice (response). The order form and invoice are part of the protocol used to communicate in this case.

[0016] Yet another component of one embodiment of the present invention is cache. Cache is a temporary storage area for frequently accessed or recently accessed data. There are two kinds of cache: internal (or memory cache) and external (or disk cache). Internal cache is built into a CPU, and external cache is located on a motherboard. When data is downloaded from a web page, the data is "cached" (i.e., temporarily stored on a computer). The next time the web page is accessed, instead of requesting a file from a Web server, a Web browser accesses it from the cache, so the page loads quickly.

[0017] Another component of the one embodiment of the present invention is Internet Server Application Program Interface (ISAPI), which is an application program interface for Internal Information Server (IIS) Web Server produced by Microsoft Corporation of Redmond, Washington. ISAPI enables programmers to develop Web-based applications that run much faster than conventional Common Gateway Interface (CGI) programs because they are more tightly integrated with the Web server.

Architecture

[0018] With these concepts in mind, an exemplary embodiment of a system architecture of the present invention can be explored. **Figure 1** is a block diagram illustrating an exemplary network-based commerce facility in the form of an Internet-based auction facility 10. While an exemplary embodiment of the present invention is described within the context of an auction facility, it will be appreciated by those skilled in the art that the invention will find application in many different types of computer-based, and network-based, commerce facilities.

[0019] The term "offering" is used below to designate any offering by a seller to a buyer, and this term should be understood to include, but not be limited to, any product or service offering.

[0020] For the purposes of the present specification, the term "site" shall be taken to comprise a collection of linked resources that may be accessed via a network. For example, a site may be represented on the World Wide Web (WWW), and include a collection of web pages (e.g., markup language documents) that may be static, store documents, or dynamically generated documents, between which links exist. The resources that constitute the site may furthermore be any documents, files, applications, application components or the like. A site may, for example, be owned or managed by an individual, a company or organization. Within the context of the WWW, a web site typically is characterized in that all resources of the web site are addressed utilizing a common domain (e.g., www.ebay.com or www.ebay.co.uk).

[0021] For the purpose of the present specification, the term "region" shall be taken to include any geographically identifiable area, demarcated according to political, economic, cultural, social or other criteria. The term "community" shall similarly be taken to include any grouping of people, defined according to social, political, economic, cultural, geographic or other criteria.

[0022] Referring to **Figure 1**, the auction facility 10 includes one or more of a number of types of front-end servers, namely communications servers in the exemplary form of page servers 12 that deliver web pages (e.g., markup language documents), picture servers 14 that dynamically deliver images to be displayed within Web pages, listing servers 16, processing servers in the exemplary form of CGI (or ISAPI) servers 18 that provide an intelligent interface to back-end servers, and search servers 20 that handle search requests to the

facility 10. E-mail servers 21 provide, *inter alia*, automated e-mail communications to users of the facility 10.

[0023] The back-end servers include a database engine server 22, a search index server 24 and a credit card database server 26, each of which maintains and facilitates access to a respective database.

[0024] The Internet-based auction facility 10 may be accessed by a client program 30, such as browser (e.g., the Internet Explorer distributed by Microsoft Corp. of Redmond, Washington) that executes on a client machine 32 (e.g., a personal computer, PDA, cell phone or the like) and accesses the facility 10 via a network 34 such as, for example, the Internet. Other examples of networks that a client may utilize to access the auction facility 10 include a wide area network (WAN), a local area network (LAN), a wireless network (e.g., cellular network), or the Plain Old Telephone Service (POTS) network.

[0025] **Figure 2** is a database diagram illustrating an exemplary database 23, maintained by and accessed via the database engine server 22, which at least partially implements and supports the auction facility 10. The database 23 may, in one embodiment, be implemented as a relational database, and includes a number of tables having entries, or records, that are linked by indices and keys. In an alternative embodiment, the database 23 may be implemented as collection of objects in an object-oriented database.

[0026] Central to the database 23 is a user table 40, which contains a record for each user of the auction facility 10. A user may operate as a seller, buyer, or both, within the auction facility 10. The database 23 also includes an items table 42 that may be linked to the user table 40. A user record in the user table 40 may be linked to multiple items that are being, or have been, auctioned via the facility 10.

[0027] The database 23 also include a note table 48 populated with note records that may be linked to one or more item records within the items table 42 and/or to one or more user records within the user table 40. Each note record within the table 48 may include, *inter alia*, a comment, description, history or other information pertaining to an item being auction via the auction facility 10, or to a user of the auction facility 10.

[0028] A number of other tables are also shown to be linked to the user table 40, namely a user past aliases table 50, a feedback table 52, a feedback details table 53, a bids table 54, an accounts table 56, and an account balances table 58.

[0029] The database 23 is also shown to include two tables specifically to enable an exemplary embodiment of the present invention. A master categories table 60 stores records for all the item categories presented across multiple, regional or community views (or presentations) of item categories via regional or community sites presented by the facility 10 throughout the world. A site categories table 62 stores records indicating which item categories are to be presented for respective regional or community sites, (e.g., a country, region or city specific site) presented by the facility 10. In other words, the master categories table 60 stores records for each category of a global collection of categories, and the site categories table 62 stores records indicating which of the global collection of categories are to be presented by each of a number of regional sites, along which information pertaining to the customized presentation of each category in a region-specific manner (e.g., a regional description, currency, language etc.).

[0030] **Figure 3A** illustrates an exemplary embodiment of the items table 42. An Id field stores a numerical identification number for each item available via the auction facility 10. A sale_type field contains information about acceptable payment options such as check, cash, and credit cards. The next field, title field,

stores a descriptive title of the item to be displayed to the user of the auction facility 10. A location field contains information about a geographic location of the item, i.e. country, region, and specific address. This geographic location information may, in one embodiment, be a geographic location at which a seller of the item resides or may alternatively be information specified by the seller as the geographic location of the actual item. The information about which category the item belongs to is stored in a category field. For example, an item Barbie™ doll may belong to Toys category. Fields such as billing_currency, shipping_option, ship_region, description_language, site_id include information that depends on the location of the seller of the item or of the item itself, or the willingness of the owner of the item to ship the item to another geographic location or region. For example, the billing currency for a particular item may be derived from the currency utilized at a geographic location (e.g., a country) in which the seller resides. Alternatively, the seller of the item may specify a particular currency in which the seller wishes to receive payment.

[0031] The shipping option information is typically inputted by seller, and indicates one or more shipping options (e.g., mail, courier-same day, courier-next day) specified by the seller.

[0032] The ship_region information may be inputted by a seller to indicate one or more geographic regions to which the seller is willing to ship the item or, in the case of services, to perform a particular service.

[0033] The description language information may be, as a default condition, populated with a predominate language in a geographic region or location in which the seller resides. For example, a seller located in the US may, as a default condition, have a description language indicated as English. A seller located in Germany would have German indicated as a default description language. In one embodiment, the seller may also specify an alternative description language

to override a default condition. For example, a seller located in Japan may wish to specify that the description language is English in order to have the description of the relevant item available to a broader worldwide audience.

[0034] Site_id information identifies a geographically specific, or regional, site, presented by the auction facility 10, via which the seller offered the item for sale. For example, a Japanese seller may have placed an item up for auction via a Japanese site, presented by the auction facility 10, in which case the site_id information identifies the Japanese site.

[0035] It will be appreciated by one skilled in the art that the tables may have additional fields and are not limited to the above-described fields.

[0036] Figure 3B illustrates an exemplary embodiment of the master categories table 60. A category_id field contains a unique numeric identifier of a category and name field stores a descriptive name of the category that is displayed to the user using the auction facility 10. A description field of the table 60 contains descriptive information about the category. Parent_id and parent_name fields are used in locating a particular category in a tree data structure (e.g., a tree hierarchy) order when displaying categories to the user. It will be appreciated that the above-described fields are an exemplary embodiment and other fields may be incorporated into the master categories table.

[0037] Figure 3C illustrates an exemplary embodiment of the site categories table 62. The table 62 stores category information relevant to each of multiple regional (or geographically-specific) sites presented by the auction facility 10. One of the fields in the table is a site_id field, which stores a unique numeric identifier that is assigned to each of multiple regional or community sites. Category_id field stores a numeric identifier for a category that keys the relevant record to a category record within the master categories table 60. Name and

description fields store a regional or community name of the category and description of the category. Parent_id and parent_name fields are used in placing a particular category in a tree data structure (e.g., a tree hierarchy) when displayed to the user of the auction facility 10. Fields such as currency and language are region specific and store information that facilitates displaying to the user information in the specified language and in the currency of the site. It will be appreciated that the above-described fields are an exemplary embodiment and other fields may be incorporated into the site categories table.

[0038] **Figure 4** illustrates an exemplary embodiment of a code system that contains some of the necessary modules that relate to the present invention. A kernel 100 is responsible for, *inter alia*, (1) determining which site the user entered and for (2) caching site categories in a site categories cache 150, ensuring higher performance by eliminating redundant accesses to the database 23 in which the tables 60 and 62 are stored. A category tree 160 stores categories in a tree data structure. A batch job module 140 is responsible for displaying initial web pages to a user of the auction facility 10. A search module 130 is responsible for performing searches through the item space, i.e. categories, when requested by the user. In one embodiment of the present invention, listings module 120 ensures that items that are displayed to the user are the ones that are available for shipping (or performance) in a region in which a user is located or that a user has specified. Another module that is present in the system is an ISAPI module 110. Category_tree update module 180, which is part of the kernel 100, is a piece of code that is responsible for constructing the category tree 160 in order to ensure that the categories are displayed in a correct hierarchical relationship to the user of the auction facility 10. Parser 170 is a module that determines which site the user has entered. View module 190 generates the user-requested items and for display to a user (e.g., via a Web browser). Currency conversion module

195 is responsible for converting a price in listing currency into a regional (or native) currency for a particular site.

Map File

[0039] In order to increase the performance efficiencies of the facility 10, according to one embodiment of the present invention, a map file 200 is generated by the listings module 120, the map file 200 including summarized item records for each of the complete item records maintained in the items table 42. Furthermore, the summarized item records within the map file 200 are pre-categorized, or grouped, so as to facilitate improved responses to queries against the map file 200. The grouping of summary item records is conveniently labeled as views 210, which may be retrieved with minimal processing for display to a user. The summary item records constituting the map file 200 may include limited information, such as an item identifier, a title, a currency, and a data value, for example. The map file 200 may be utilized to facilitate browsing of items that are actively being auctioned by the facility 10, wherein the facilitating of the browsing requires only limited information regarding each item.

[0040] **Figure 5** is a diagrammatic representation, according to an exemplary embodiment of the present invention, of the generation of the map file 200 by the listings module 120 utilizing information contained in the items table 42. For example, the listings module 120 may comprise a Dynamic Link Library (DLL) that is utilized periodically to generate a fresh map file 200 from the full item records of the items table 42. It will be appreciated that the frequency with which the map file 200 is regenerated may vary depending on the frequency with which records are added to the items table 42. For example, in a heavily trafficked and active facility 10, the frequency with which map file 200 requires

regeneration by the listings module 120 will be more frequent than for a facility 10 that is less active.

[0041] **Figure 6** is a diagrammatic representation of case logic implemented by the listings module 120, according to an exemplary embodiment of the present invention. Specifically, the listings module 120 is shown to implement three case statements, namely a "currency" case statement 202, a "region" case statement 204 and an "available" case statement 206. As will be described in further detail below, each of the case statements 202, 204 and 206 operates to generate a distinct view 210 of summary item records for each of multiple categories listed in the master categories table 60.

[0042] **Figure 7** is a diagrammatic representation of a map file 200, according to an exemplary embodiment of the present invention. Specifically, the map file 200 is shown to include an index 208 to multiple views of summary item records (e.g., within each category defined within the master categories table 60). In one embodiment, the map file 200 comprises a binary file. In summary, the map file 200 may be regarded as presenting a pre-organized (or grouped) summarization of information contained in the items table 42 that is maintained in memory of a computer system to provide performance advantages for browsing and searching operations.

[0043] **Figure 8** is a flow chart illustrating a method 220, according to an exemplary embodiment of the present invention, of generating the map file 200. At block 222, the listings module 120 accesses the items table 42 and, at block 224, identifies item records for items within a particular category N (e.g., category 0). Having then identified such item records, at block 226, the "currency" case statement 202 is applied against the item records identified at block 224 to generate a "currency" view 210A. Specifically, the listing module, for each of a pre-defined collection of currencies, determines if the currency information for

each item record matches a respective pre-defined currency. For example, a first application of the case statement 202 at block 226 may determine whether the currency for each item record identified at block 224 is Australian dollars.

Further, at block 226, the case statement 202 is applied to determine whether description language information for each of the relevant item records matches a predefined language, or set of languages, associated with the predefined currency. For example, a determination made during a first application of the case statement 202 may be made as to whether the description information language information indicates the English language. Assuming both the currency and description language comparisons are positive, then selected information from the relevant item record is included within the "currency" view 21A for the relevant currency. For example, a first application of the case statement 202 at block 226 may generate a view constituting summarized item records for all items being actively auctioned via the facility 10 for which the price is specified in Australian dollars, and the description language is English.

[0044] It will be appreciated that the case statement 202 will be applied for each of the predefined set of currencies to thereby generate a respective "currency" view 21A for each of the predefined set of currencies.

[0045] Similarly, at block 228, the "region" case statement 204 is applied against the item records retrieved at block 224 for each of a predefined set of regions, so as to generate a respective "region" view 210B for each of the set of regions. Specifically, location information from each of the item records is compared against a respective region of the predefined set of regions, and language description information is similarly compared against one or more languages associated with each of the regions to determine whether a summary item record, derived from the full item record, should be included within the relevant "region" view 210B. The predefined set of regions may specify regions

with any resolution, ranging, for example, from a suburb of a city to a continent or broader geographically identifiable area. For example, a region could comprise a town, a city, a metropolitan area, a county, a state, a country or a continent.

[0046] Further, as noted above with respect to **Figure 3A**, the location information within each item record of the items table 42 may be the indicated location of a seller of the item. This information may or may not be important to a buyer, depending on the nature of the item. For example, where the item is a motor vehicle, clearly the location of the seller, and therefore probably the item, is important to a buyer in that the buyer may be more inclined to purchase a motor vehicle from a local seller. On the other hand, should the item be easily shipped (e.g., a stamp), the location of the seller may be of less consequence.

[0047] Returning to the method 220 illustrated in **Figure 8**, at block 230, the listings module 120 then applies the "available" case statement 206. The case statement 206 performs three inquiries that are OR'ed to determine whether a summary item record, derived from a full item record, should be included within a respective "available" view 210C. Again, for a predefined set of regions, the case statement 206 determines whether shipping region information indicated in the item record corresponds to a respective region of the predefined set of regions. A further determination is made as to whether the shipping region information indicates that the seller is willing to ship worldwide. A further determination is then made as to whether the location information of the item record indicates the seller location as being within the respective region. Should any of these three conditions be met, then a summary item record is generated from the relevant full item record, and included within the "available" view for the respective view 210C.

[0048] At block 232, the listings module 120 then increments a category number to a subsequent category, whereafter the method 220 loops back to block 224, to commence the view generation process 226 - 230 with respect to a further category.

[0049] While the method 220 is shown to generate multiple views 210 for each category based on currency, region and regional availability criteria, it will be appreciated that views (e.g., predefined groupings of information) may be generated based on any one of multiple criteria in terms of which item records may be conveniently browsed and/or searched.

[0050] **Figure 9** is a diagrammatic representation showing further details of an exemplary implementation of the map file 200. Specifically, the index 208 is shown to constitute a header 240, a number of category indexes 242 that in turn point to an availability index 244 that points to a range index 246, that in turn points to a list of items index 248. Region and currency indexes, similar to the availability index 244, may be utilized to define the "region" views 210B and the "currency" views 210A.

Methodology and User Interfaces: Browsing

[0051] To enable users (e.g., potential buyers) conveniently to locate items that are being offered for sale via the facility 10 (e.g., via auction), the facility 10 may provide, according to the present invention, both item browse and search capabilities, each of which will be discussed below.

[0052] Dealing first with the browsing capability, this capability is enabled, in one embodiment, by a hierarchical structure of categories, as defined within the master categories table 60 and, for individual regional sites, within the site categories table 62. As discussed above with reference to **Figures 3B** and **3C**, each of the tables 60 and 62 maintains a listing of categories, and also defines a

hierarchical relationship between such categories. In one embodiment, the category_tree update module 180 accesses the tables 60 and 62 to construct hierarchical category data structures within the site categories cache 150.

[0053] **Figure 10** is a page map diagram illustrating an exemplary site map 250 that constitutes part of a regional or community site (e.g., www.ebay.com.au) provided by the facility 10. Specifically, each of the pages included within the map 250 provides links to multiple further pages, a limited number of these links being illustrated in **Figure 10** for the purposes of illustration.

[0054] A main page 252 is shown to provide links to a sell index page 254 that in turn links to resources to enable a seller to offer an item for sale (e.g., by auction) via the facility 10.

[0055] The main page 252 further provides links to a browse index page 258 that in turn provides access to search features to enable, for example, a potential buyer to search items offered for sale via the facility 10.

[0056] The main page 252 may also provide a link to a browse index page 256, which facilitates the browsing of offerings provided by the facility 10 utilizing the hierarchical category data structures discussed above. The browse index page 256 is furthermore shown to provide links to multiple category browser index pages 260, which represent pages displaying information concerning lower levels of a relevant hierarchical category data structure and item index pages 262 that lists items within a particular category, when the category to which the user has navigated includes a sufficiently small number of items. Further information concerning these items may be displayed to a user in a meaningful manner.

[0057] It will be appreciated that where the facility 10 provides multiple regional or community sites, each of which provide access to a common body of product offerings (e.g., the items included within the items table 42), it may be desirable to customize the browsing features provided by the respective regional

or community sites according to regional or community conditions or preferences. In the present invention, such customization of the browsing features of each of multiple regional or community sites is facilitated in part by a site-specific category hierarchical data structures maintained within the site categories cache 150.

[0058] **Figure 11** is a flowchart illustrating a method 270, according to an exemplary embodiment of the present invention, of generating and communicating information concerning a hierarchical category data structure to a user, so as to enable the user to browse a collection of offerings via the facility 10.

[0059] The method 270 commences at block 272 with the input by a user of a location identifier in the exemplary form of a Uniform Resource Locator (URL). The input of the URL may be performed by user selection of a link (e.g., user selection of hypertext) presented within any one of the pages 252 - 262 of the site map 250 illustrated in **Figure 10**. Alternatively, the URL may be manually inputted into a URL field. The URL is, in one embodiment, inputted into a client program 30 operating on a client machine 32.

[0060] At block 274, the client program 30 communicates a request, including the inputted URL, via a network 44 to the facility 10.

[0061] At block 276, the parser 170 of the kernel 100 receives the request (e.g., an HTTP GET request) that includes the URL, and parses the URL to identify one of multiple regional sites provided by the facility 10 and potentially, a category selection indicated in the URL. The request may also specify a view by way of "currency/region/availability" view selection criteria. For example, receipt of the URL www.ebay.com.au indicates receipt of the request via an Australian site provided by an auction facility 10 (e.g., eBay, Incorporated, of San Jose, California). Typically, the site may accordingly be identified from the machine

domain portion of a URL, while the "path-of-file" portion of the URL may include category selection information. The "machine domain" portion of a URL is also sometimes referred as the "domain" portion while the subsequent content of the URL may be known as a "URL-path" portion.

[0062] At block 178, the kernel 100 then identifies a regional site (e.g., an Australian site) supported by the facility 10, which is addressed by the URL. At block 280, the kernel 100 then accesses a hierarchical site category data structure, associated with the identified regional site, the relevant category data structure being maintained in the site categories cache 150.

[0063] At decision block 282, the kernel makes a determination as to whether an item listing is required. Specifically, this determination may be made dependent upon the number of items within a particular category. For example, if the number of items within the category may conveniently be displayed to the user (e.g., where the category comprises a "leaf" category) then an item listing may be determined as being required. Alternatively, should the category be "all" umbrella category, clearly it may be undesirable to display listings for all items available for a particular site.

[0064] If it is determined at decision box 282 that an item listing is not required, at block 284, a further category browse index page is generated utilizing the relevant site category data structure. Specifically the browse index page generated may merely provide a listing of categories below the category indicated by the category selection identified at block 276.

[0065] On the other hand, should an item listing be required, at block 286, the kernel accesses the map file 200 to locate a view based on the relevant category selection, as well as the "currency/region/availability" view selection criteria discerned at block 276.

[0066] At block 288, an item list index page 262 is generated.

[0067] At block 290, the index page generated at either block 284 or 288 is then transmitted from the facility 10, via the network 34, to the client machine 32, and displayed to a user at block 292 by the client program 30.

[0068] It should also be noted that the item index page 262, generated at block 288, may also include category information extracted from the site category data structure, or included within the view identified at block 286.

[0069] Examples of item list index pages 262 generated by two different regional sites are shown in **Figures 12A - 12D, 13A - 13D, and 14A - 14E**.

Specifically, **Figures 12A - 12D** illustrate an exemplary item list index page 262 generated responsive to the URL indicated at 300. As will be apparent from the URL 300, the relevant regional site is the United Kingdom site provided by eBay, Incorporated, this site being identified by the machine domain 302.

[0070] A view selection criteria is indicated at 304 (e.g., the location view selection indicating that the view should provide items located in the United Kingdom), while a category selection is indicated at 306 (e.g., category 267 that is the "books" site category of the parent "books, films, music" category).

[0071] The item list index page 262 shown on **Figure 12A** also includes view selector icons 308 that are user selectable to alter the view selection category 304. The view selector icons 308 include a currency view selection icon 310, a region view selection icon 312 and an available view selection icon 314. User selection of any of the icons 310, 312, 314, as described with reference to **Figure 11**, results in the generation of a fresh index page propagated with an alternative view according to the viewer selection specified in URLs associated with each of icons 310, 312 and 314.

[0072] It will also be noted, from **Figure 12B**, as the item list index page 262 is being presented via the United Kingdom site, a conversion from U. S. dollars to

U. K. £ is automatically provided for items that may originally have been listed in U.S. dollars.

[0073] The item list index page 262 illustrated in **Figures 13A - 13D** is generated by facility 10 for the Australian site supported by the facility 10. It will be noted that the categories presented for browsing in the Australian version of the index page 262 differ from those shown in the United Kingdom version shown in **Figures 12A - 12D**. For items are listed in the currency other than the Australian dollar, a conversion to Australian dollars is also provided.

[0074] **Figures 14A - 14B** illustrates an example of an item list index page 262, where the view selection 304 specified by an exemplary URL indicates the "available" action view for the Australian site.

[0075] **Figures 15A - 15C** illustrate an exemplary category browse index page 260 for a German site operated by a facility 10. The category descriptions, derived from the appropriate category records for the German site maintained in the site categories table 262, are in the German language.

Methodology and Use Interfaces: Search

[0076] **Figure 16** illustrates a page map 271, according to an exemplary embodiment of the present invention, that may be accessible via a search index page 273, the pages of the page map 271 providing access to search resources to locate offerings via facility 10. More specifically, a "smart search" page 275, one or more by criteria search pages 277 and an international search page 279 may be provided by the facility 10. Examples of each of these pages shall be discussed below with reference to **Figures 18A - 18F**.

[0077] **Figure 17** is a flow chart illustrating a method 281, according to an exemplary embodiment of the present invention, of facilitating a search of offerings of a facility 10. The method 281 commences at block 283 with user

input of a search request that identifies the regional site via which the request originated (e.g., within the machine domain portion of the URL) as well as various search criteria. The search criteria may be inputted, as will be described below with reference to **Figures 18A - 18F** into web page interfaces generated by the server 12 and communicated to a client machine 32 for display by client program 30. The search criteria may include any one or more of a key word, a region (or community) specification, and a user selection, indicating whether a relevant item should be located within the specified region, available within the specified region, or listed in a currency of the specified region. Certain of the above criteria may be absent, or may automatically be specified by the relevant interface.

[0078] At block 285, the client program 30 then communicates the request (e.g., an HTTP POST request) via the network 34 to the facility 10.

[0079] At block 287, having received the request at the facility 10, the parser 170 parses the request to identify the site (e.g., the Australian site) from which the request originated and to extract the search criteria therefrom.

[0080] At block 289, the kernel 100 then accesses the map file 200, and locates summary item records based on the search criteria and the determined site. The location of the summary item records at block 289 may be performed in a number of ways. In a first embodiment of the present invention, the search module 130 may perform a "brute force" search of the map file 200. In an alternative embodiment, the kernel 100 may locate a view 210 utilizing the region specification, as well as the view specification (e.g., located, available or currency). Having so located an appropriate view, the search module 103 may then perform a search of only the appropriate view utilizing the key word.

[0081] In a further embodiment the kernel may access the items table 42 relative to a view to retrieve appropriate information from this table 42.

[0082] In yet another embodiment the kernel instead of accessing the map file 200, accesses a search database that is created from the items table 42 and indexed by the search indexer server 24. The data in the search database may be indexed by indices, e.g., the database may be indexed regionally. For example, for a regional search, the search dynamic link library (dll) first may retrieve all of items available in a particular region and then perform a key word search within the retrieved subset of results.

[0083] At block 290, a search result page is generated, which is then communicated to the client machine 32 at block 292, and displayed by the client program 30 to a user at block 294.

[0084] As will be appreciated from the below discussion of **Figures 18A - 18F**, the search criteria included in the request transmitted from the client machine 32 to the facility 10 may include criteria in addition to those listed above. Specifically, category search criteria may also be included.

[0085] **Figure 18A** illustrates an exemplary search request interface 296, in the form of a markup language document, via which a user may input the above discussed search criteria. Utilizing a drop-down menu presented within a country input field 298, a user may specify a country (i.e., a region), and also indicate whether items located by the search should in fact be located within the country or merely available to the country. Further, utilizing a currency input field 301, which is populated utilizing a drop-down menu, the user may specify a currency in which items located by the search are listed.

[0086] **Figure 18B** illustrates the "smart search" page (or interface) 274 for a particular regional site. The "smart search" page 274 is distinguished in that a search request issued therefrom is identified by the facility 10 as having originated from a regional site, and the facility 10 thus excludes from the search result items that fail to meet certain criteria (e.g., language, currency or other

criteria). For example, where a "smart search" is initiated from a Japanese site operated by facility 10, the facility 10 may only return items for which the description language is the Japanese language. Similarly, a search initiated from a "smart search" page 274 for a US site would exclude items for which the description language is Japanese.

[0087] **Figure 18C** illustrates the display of a drop-down menu 303 presenting a predetermined list of regions (e.g., U.S. cities) that may be presented by an interface for user selection. The predetermined list of regions presented in the drop-down menu 303 is dependent on the regional site.

[0088] **Figure 18D** illustrates an example of an international search page 278 that corresponds substantially to the interface 296 shown in **Figure 18A**. In **Figure 18D**, a drop-down menu of regions (e.g., countries) displayed to facilitate convenient input into a country input field 298.

Method and User Interfaces: Currency Conversion

[0089] **Figure 19** is a flow chart illustrating a method 320, according to the present invention, of performing a currency conversion for offerings via the facility 10.

[0090] At block 322, the user inputs a location identifier for an item, or an item list index page. The location identifier is typically a URL and is inputted by (1) user selection of hypertext, having the relevant URL associated therewith or (2) input into an interface presented by the client program 30.

[0091] At block 324, the client machine 32 communicates a request, including the URL, to the facility 10 via the network 34.

[0092] At block 326, the parser 170 parses the URL to identify a regional site from which the request originated, and also to identify the item, or index page, identified within the URL.

[0093] At block 328, the kernel identifies a currency associated with the regional site (e.g., Australian dollars or a request originated from an Australian site), as well as the currency in which an item, or items within the index page, are listed. In one embodiment, the kernel identifies a user-preferred display currency, which is specified directly by a user, through a saved preference or a cookie and displays the items in the user-specified currency. If currency is not specified by the user, the default currency of a site may be used by the kernel.

[0094] At decision block 330, a determination is made by the kernel 100 as to whether the site currency matches the currency of the one or more items.

[0095] In the event that there is not a correlation between the site currency and the currency of the at least one item, at block 332, the kernel 100 accesses a conversion table, utilizing a currency conversion module 195, and performs an item-to-site currency conversion for items for which the currency does not match the site currency.

[0096] At block 334, the kernel 100 then generates an item page, or an index page, to include both item and site currency values.

[0097] On the other hand, if it is determined at decision block 330 that the site currency does match all relevant item currencies, at block 336, the kernel 100 generates an item page, or index page, to include the site currency value.

[0098] At block 334, the item page, or index page, is communicated to the client machine 32, where it is displayed by the client program 30 to a user.

[0099] Examples of index pages including converted currency amounts have been discussed above with reference to **Figures 12A - 12B, 13A - 13D, and 14A - 14E. Figures 20A and 20B** provide examples of item pages for an item originally listed in pounds, but where the item pages are retrieved via U.S. and French sites, respectively.

[0100] A facility 10 may also provide summary pages to buying and selling users regarding transactions within which they have participated. Currency conversions may also be provided within such pages, or any pages delivered by the auction facility 10 wherein financial information appears.

[0101] In summary, the present invention is advantageous in that it allows a common collection of offering information (e.g., item records within an item table) to be utilized to service multiple regional or community sites, and allows such multiple regional or community sites to customize the presentation of information regarding such offerings to account for local preferences, conditions and tastes. Further, by having a common body of offering information accessible via multiple regional or community sites, the present invention allows user flexibility regarding the specification of items to be presented to the user, and also allows the facility 10 to implement automatic measures to insure the delivery of offering information to a user that is of interest to the user, or that is understandable to the user. A particular example of this is the language "filter" discussed above that is implemented in the case statements 202 and 204 to insure that views for a particular region only include items for which a descriptive language would be typically understood within that region. Further, the "smart search" pages discussed above provide an example of a service offered by the facility 10 whereby items, for which the language description is inconsistent with the regional site from which the request originated, are filtered out from search results presented to a user.

Computer System

[0102] **Figure 21** shows a diagrammatic representation of machine in the exemplary form of a computer system 400 within which a set of instructions, for causing the machine to perform any one of the methodologies discussed above,

may be executed. In alternative embodiments, the machine may comprise a network router, a network switch, a network bridge, Personal Digital Assistant (PDA), a cellular telephone, a web appliance or any machine capable of executing a sequence of instructions that specify actions to be taken by that machine.

[0103] The computer system 400 includes a processor 402, a main memory 404 and a static memory 406, which communicate with each other via a bus 408. The computer system 400 may further include a video display unit 410 (e.g., a liquid crystal display (LCD) or a cathode ray tube (CRT)). The computer system 400 also includes an alphanumeric input device 412 (e.g., a keyboard), a cursor control device 414 (e.g., a mouse), a disk drive unit 416, a signal generation device 418 (e.g., a speaker) and a network interface device 420.

[0104] The disk drive unit 416 includes a machine-readable medium 422 on which is stored a set of instructions (i.e., software) 424 embodying any one, or all, of the methodologies described above. The software 424 is also shown to reside, completely or at least partially, within the main memory 404 and/or within the processor 402. The software 424 may further be transmitted or received via the network interface device 420. For the purposes of this specification, the term "machine-readable medium" shall be taken to include any medium which is capable of storing or encoding a sequence of instructions for execution by the machine and that cause the machine to perform any one of the methodologies of the present invention. The term "machine-readable medium" shall accordingly be taken to include, but not be limited to, solid-state memories, optical and magnetic disks, and carrier wave signals.

[0105] In the foregoing specification the present invention has been described with reference to specific exemplary embodiments thereof. It will, however, be evident that various modifications and changes may be made to the specific exemplary embodiments without departing from the broader spirit and scope of

the invention as set forth in the appended claims. Accordingly, the specification and drawings are to be regarded in an illustrative rather than a restrictive sense.